IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (Currently Amended): ~~Method~~ A method for evolving an X protein encoded by a *Lactobacillus fermentum* (*L. fermentum*) *ntd* gene ~~so as~~ to modify its characteristics, comprising the following ~~stages~~ steps:

a) obtaining mutants of the L. fermentum ntd gene by random mutagenesis;

b) ~~transformation of~~ transforming cells comprising a [P-] phenotype with vectors comprising the mutated nucleic acid obtained in ~~stage~~ step a) coding for the thus modified X* proteins, P-meaning that said cells are auxotrophic for the substance P, P being the product of the action of X on its natural substrate S;

c) ~~culture of~~ culturing said cells in a medium comprising a substrate S*,

S* being an analogue of the natural substrate S of said X protein; and

d) ~~selection of~~ selecting the cells [P-:: X*] ~~which~~ that have survived ~~stage~~ step c) in which the X* proteins are capable of carrying out the biosynthesis of the product P from the substrate S*.

Claim 2 (Currently Amended): ~~Method~~ The method according to claim 1, ~~characterized in that~~ wherein the mutant X* protein obtained is a protein possessing an activity similar to said protein X, i.e. belonging to the same or adjacent enzyme classes having at least the first three figures 2.4.2 of the EC 4-figure international nomenclature classes.

Claim 3 (Currently Amended): ~~Method~~ The method according to ~~one of claims 1 and 2, characterized in that~~ claim 1, wherein the cells used in ~~stage~~ step b) are obtained by the

inactivation of at least one gene involved in the natural metabolic pathway leading to the product P.

Claim 4 (Currently Amended): ~~Method~~ The method according to claim 3, ~~characterized in that~~ wherein the protein X* complements the deficiency of the natural metabolic pathway leading to the product P in a medium provided with the substrate S*.

Claim 5 (Currently Amended): ~~Method~~ The method according to ~~one of claims 1 to 4, characterized in that~~ claim 1, wherein the activity of the protein X on the substrate S is at least two times greater than its activity on the substrate S*.

Claim 6 (Currently Amended): ~~Method~~ The method according to ~~one of claims 1 to 5, characterized in that~~ claim 1, wherein the activity of the protein X* on the substrate S* is at least 10 times greater than its activity on the substrate S.

Claim 7 (Currently Amended): ~~Method~~ The method according to ~~one of claims 1 to 6, characterized in that~~ claim 1, wherein the random mutagenesis of ~~stage~~ step a) is carried out either by variation of the manganese concentration during the PCR reaction, or by the use of promutagenic nucleotide analogues or also by the utilization of primers comprising a random sequence.

Claim 8 (Currently Amended): ~~Method~~ The method according to ~~one of claims 1 to 7, characterized in that~~ claim 1, wherein said cells are prokaryotic or eukaryotic cells, preferably *E. coli*.

Claim 9 (Currently Amended): ~~Method~~ The method according to ~~one of claims 1 to 8 characterized in that~~ claim 1, wherein an N-deoxyribosyl transferase (DTP) of *L. fermentum* is evolved [[so as]] to obtain a protein ~~which~~ is an N-dideoxyribosyl transferase by the following ~~stages~~ steps:

a) obtaining DTP* mutants of the sequence coding for an N-deoxyribosyl transferase (DTP) by random mutagenesis;

b) ~~transformation of~~ transforming cells comprising an [N-] phenotype with vectors comprising the mutated nucleic acid obtained in ~~stage~~ step a) coding for the DTP* proteins, N- meaning that said cells are auxotrophic for at least one nucleoside, said nucleoside being the product of the action of DTP on its natural substrate dR-N;

c) ~~culture of~~ culturing said cells in a medium comprising a ddR-N substrate; and

d) ~~selection of~~ selecting the [N-:: DTP*] cells ~~which~~ that have survived ~~stage~~ step c) in which the DTP* proteins are capable of carrying out the transfer of the dideoxyribose (ddR) from a dideoxyribonucleoside to another nucleoside leading to the production of the N nucleoside necessary for the survival of the cells.

Claim 10 (Currently Amended): ~~Method~~ The method according to claim 9 ~~characterized in that~~ wherein the (ntd) sequence encoding the N-deoxyribosyl transferase (DTP) of *L. fermentum* corresponds to SEQ ID No. 1 which is being evolved.

Claim 11 (Currently Amended): ~~Method~~ The method according to ~~one of the claims 9 and 10 characterized in that~~ claim 9, wherein the cells used in ~~stage~~ step b) are bacteria of genotype *ΔpyrC, ΔcodA, Δcdd* deficient in the metabolic pathway leading to uracil.

Claim 12 (Currently Amended): ~~Method~~ The method according to claim 11, ~~characterized in that~~ wherein the bacteria of genotype *ΔpyrC, ΔcodA, Δcdd* deficient in the metabolic pathway leading to uracil used are *E. coli*.

Claim 13 (Currently Amended): ~~Mutated~~ A method N-deoxyribosyl transferase protein (DTP) ~~capable of being obtained~~ from the method according to ~~one of claims 1 to 12, characterized in that it~~ claim 1, wherein the protein has a modified activity.

Claim 14 (Currently Amended): ~~Protein~~ The protein according to claim 13, ~~characterized in that it~~ wherein the protein has an N-dideoxyribosyl transferase activity and/or an activity on deoxy or dideoxyribonucleoside analogues comprising a modified base.

Claim 15 (Currently Amended): ~~Protein~~ The protein according to claim 13[[or 14]], ~~characterized in that it~~ wherein the protein has a sequence at least 70% identical to SEQ ID No. 2 and ~~containing~~ contains the residues Y13, D77, D97,E103, M132.

Claim 16 (Currently Amended): ~~Protein~~ The protein according to claim 15, ~~characterized in that it~~ wherein the protein has a sequence identity with SEQ ID No. 2 greater than or equal to 80%.

Claim 17 (Currently Amended): ~~Protein~~ The protein having an N-dideoxyribosyl transferase activity according to ~~any one of claims 14 to 16, characterized in that~~ claim 14, wherein the sequence comprises SEQ ID No.4.

Claim 18 (Currently Amended): ~~Protein~~ A protein having an activity on deoxy- or dideoxyribonucleoside analogues, having a percentage identity with SEQ ID No. 4 equal to or greater than 70%, and comprising a threonine residue corresponding to the mutation point A15T of SEQ ID No. 4.

Claim 19 (Currently Amended): ~~Protein~~ The protein according to claim 18, ~~characterized in that it~~ wherein the protein has a percentage identity with SEQ ID No. 4 equal to or greater than 80%.

Claim 20 (Currently Amended): ~~Protein~~ The protein according to ~~one of claims 18 and 19, characterized in that~~ claim 18, wherein the sequence of said protein ~~moreover~~ further comprises the residues corresponding to Y13, D77, D97, E103 and M132 of SEQ ID No. 4.

Claim 21 (Currently Amended): ~~Protein~~ The protein according to ~~any one of claims 18 to 20, characterized in that~~ claim 18, wherein said protein has an N-dideoxyribosyl transferase activity.

Claim 22 (Currently Amended): ~~Protein~~ The protein according to ~~any one of claims 18 to 21, characterized in that~~ claim 18, wherein said protein has a deoxyribose and dideoxyribose and/or didehydroribose transfer activity.

Claim 23 (Currently Amended): ~~Protein~~ The protein according to ~~any one of claims 18 to 22, characterized in that~~ claim 18, wherein said protein has a catalytic activity on d4T and ddT greater than that of the native N-deoxyribosyl transferase protein of L. fermentum represented by SEQ ID No. 2.

Claim 24 (Currently Amended): ~~Protein~~ The protein according to claim 23, ~~characterized in that~~ wherein said catalytic activity on d4T and ddT is 50% greater than that of the native N-deoxyribosyl transferase protein of *L. fermentum* represented by SEQ ID No. 2.

Claim 25 (Currently Amended): ~~Protein~~ The protein according to ~~any one of claims 18 to 24, characterized in that~~ claim 18, wherein said protein has a catalytic effectiveness on d4T and ddT greater than that of the native N-deoxyribosyl transferase protein of *L. fermentum* represented by SEQ ID No. 2.

Claim 26 (Currently Amended): ~~Protein~~ The protein according to claim 25, ~~characterized in that~~ wherein said catalytic effectiveness on d4T and ddT is at least 5 times greater than that of the native N-deoxyribosyl transferase protein of *L. fermentum* represented by SEQ ID No. 2.

Claim 27 (Currently Amended): ~~Protein~~ The protein according to ~~any one of claims 19 to 26, characterized in that it~~ claim 19, wherein the protein consists of a polypeptide of sequence SEQ ID No. 4.

Claim 28 (Currently Amended): ~~Nucleic~~ A nucleic acid comprising a sequence coding for a protein having an N-dideoxyribosyl transferase activity according to ~~any one of claims 13 to 27~~ claim 13, such as the sequence SEQ ID No.3.

Claim 29 (Currently Amended): ~~Expression~~ An expression vector comprising a nucleic acid according to claim 28.

Claim 30 (Currently Amended): ~~Vector~~ The vector according to claim 29, ~~characterized in that~~ wherein the nucleic acid ~~of claim 28~~ is fused to an effective promoter for the expression of said coding sequence in the eukaryotic and/or prokaryotic cells.

Claim 31 (Currently Amended): ~~Vector~~ The vector according to ~~one of claims 29 and 30, characterized in that it~~ claim 29, wherein the vector is a plasmid capable of transforming and being maintained in *E. coli*.

Claim 32 (Currently Amended): ~~Host~~ A host cell comprising a vector according to ~~one of claims 29 to 31~~ claim 29.

Claim 33 (Currently Amended): ~~Use of a~~ A method for transferring a dideoxyribose (ddR) from a dideoxynucleoside to another nucleoside, comprising contacting the dideoxynucleoside with a protein having an N-dideoxyribosyl transferase activity according to ~~any one of claims 13 to 27 for the transfer of a dideoxyribose (ddR) from a dideoxyribonucleoside to another nucleoside~~ claim 13.

Claim 34 (Currently Amended): [[Use]] The method according to claim 33, used in the synthesis of 2',3'-dideoxynucleosides.

Claim 35 (Currently Amended): The method [[Use]] according to claim 33, used in the synthesis of 2',3'-didehydro-2',3'-dideoxynucleosides.

Claim 36 (Currently Amended): [[Use]] A method for preparing nucleosides or nucleotide analogues possessing anti-tumor properties, comprising using the host cell according to ~~any one of claims 32 to 35 for the preparation of nucleoside or nucleotide analogues possessing anti-tumor properties~~ claim 32.

Claim 37 (Currently Amended): [[Use]] The method according to claim 36 for the preparation of ddI or ddC.

Claim 38 (Currently Amended): ~~Method~~ A method for the preparation of compounds comprising a ~~stage~~ step consisting of ~~utilizing~~ using a mutated protein according to ~~one of claims 13 to 27~~ claim 13.

Claim 39 (Currently Amended): ~~Method~~ The method according to claim 38 for the preparation of nucleoside or nucleotide analogues useful for the treatment of cancer or infectious diseases, such as dideoxyribonucleosides, such as ddC and ddI or didehydro-dideoxyribonucleosides.

Claim 40 (Currently Amended): ~~Strain~~ A strain of *E. coli* deposited at the CNCM on 22nd March 2004 under accession number I-3192.